

An Expert System for Enhancing Compliance with American Heart Association Guidelines for Reduction of Risk of Coronary Artery Disease

Robert J. Cantor, M.D.
University of Missouri-Columbia

Heart disease causes one out of three deaths in the United States and is responsible for more than 500,000 hospital admissions per year.¹ The American Heart Association (AHA) has published guidelines for reducing the risk of coronary artery disease. These guidelines, which have been endorsed by the American College of Cardiology, were developed by an expert review panel who based their decisions on randomized trials, prospective controlled trials, observational studies, and epidemiological data.

Adherence to the AHA guidelines can potentially decrease morbidity, mortality, and costs for patients at risk for coronary artery disease,¹ just as improved adherence to guidelines developed for other disorders has decreased patient morbidity and costs for patients with those afflictions.^{2,3} An analysis of selected interventions in the AHA guidelines has already demonstrated that they are cost-effective.⁴

Even though the AHA guidelines are widely available, they are not necessarily widely followed. Preliminary testing has revealed that many health care providers are inadequately informed with respect to the content of the AHA guidelines. Although computer applications can improve clinical decision-making and guideline adherence,^{5,6} no computer applications have been designed to aid compliance with the AHA guidelines, according to a medline search.

Therefore, an expert system was developed to facilitate compliance with the AHA guidelines. The system, which was designed to be used on MS Windows (TM) based PC's, enables entry of specific patient information and then displays or prints relevant recommendations for each of 9 clinical areas determined by the AHA to be essential factors in decreasing the risk of coronary artery disease. The system was designed based on assumptions that 1) the person entering the information would be familiar with medical terminology and 2) the person receiving the recommendations would be a health care provider familiar with patient care and the use of common interventions. It is designed to work even when some parts of the data set are not known for a given individual. The system is able to offer different recommendations for patients whose input values fall

into borderline ranges as opposed to definitely normal or abnormal ranges. The system was programmed in a fail-safe manner, in that it matches the patient information with preprogrammed data sets before making a recommendation. If the system cannot find an exact match with any of the preprogrammed clinical data sets, no recommendation is made. Instead, the user is asked to send the pertinent information to the author so that the program can be improved. The system is currently being evaluated in a clinical trial to determine its effect on patient morbidity, mortality, and costs. It should be available for query via the World Wide Web as soon as funding is available.

References

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